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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,982

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Yoshio Tsukamoto

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EXAMINER

FUJITA, KATRINA R

ART UNIT

PAPER NUMBER

2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/773,982

Applicant(s)

TSUKAMOTO ET AL.

Examiner

Katrina Fujita

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 04/19/2004, 07/16/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 1, and 13-15 are objected to under 37 CFR 1.83(a) because they fail to show structure and method steps as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

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"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

The first line of the specification does not include a sentence acknowledging applicant's claim for foreign priority. The examiner suggests amending the specification to include that information.

At page 12, line 11, "limit (a)" should be --threshold (a)--. This also applies to page 12, line 14; page 12, line 19; page 12, line 23; page 12, line 26; page 13, line 4.

At page 12, line 13, "limit (b)" should be --threshold (b)--. This also applies to page 12, line 16; page 12, line 21; page 12, line 24; page 12, line 26; page 13, line 6.

At page 13, line 25, "limits or thresholds" should be -- ~~limits or thresholds~~ --.

At page 13, line 27, "limits (a) and (b)" should be -- thresholds (a) and (b) --.

At page 18, line 13, "S 37" should be --S 38--.

Appropriate correction is required.

Claim Suggestions

4. In claim 1, line 3, "each of colors" should be replaced with --each of color--. This also applies to claim 1, line 7; claim 9, line 15; claim 9, line 17; and claim 12, line 3.

In claim 1, line 4, "images are printed to be good" should be replaced with --good images are printed--. This also applies to claim 9, line 16 and claim 12, line 4.

In claim 4, line 2, "finding out the stained parts" should be replaced with --finding out the stained parts--. This also applies to claim 15, line 2.

In claim 5, line 3, "compensate the two level images reproduced in the memory for the positional variations" should be replaced with --compensate for the positional variations in the two level images reproduced in the memory--.

In claim 7, line 2, "limit of minus of" should be replaced with --limit of minus of --. This also applies to claim 7, line 10; claim 9, line 9; claim 9, line 10; claim 9, line 22; claim 17, line 2; and claim 17, line 12.

In claim 7, line 4, "limit of plus of" should be replaced with --limit of plus of --. This also applies to claim 7, line 11; claim 9, line 12; claim 9, line 13; claim 9, line 23; and claim 17, line 4.

In claim 8, line 2, "finding out the shortage" should be replaced with --finding out the shortage--. This also applies to claim 18, line 2.

In claim 17, line 12, "or plus of" should be replaced with --limit of or plus of --.

Claim Objections

5. Claim 1, 3, 5 and 7 are objected to because of the following informalities:

In claim 1, line 1, "which image" should be --which images--.

In claim 3, line 5, "portion" should be --portions--.

In claim 5, line 2, "very" should be --every--.

In claim 6, line 6, "reference the" should be --reference and the

In claim 7, line 11, "portion" should be --portions--.

Appropriate correction is required.

Claim Objections - 37 CFR 1.75(a)

6. The following is a quotation of 37 CFR 1.75(a):

The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

7. Claim 2 and 5 are objected to under 37 CFR 1.75(a), as failing to particularly point out and distinctly claim the subject matter which application regards as his invention or discovery.

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Claim 2 lacks antecedent basis for "the step of partitioning" at line 2. The following will be assumed for examination purposes: "the a step of partitioning".

Claim 5 lacks antecedent basis for "the positional variations" at line 2. The following will be assumed for examination purposes: "the positional variations".

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 9, and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Masuda et al. (US 4,685,139) and Ohnishi (US 4,975,971).

Regarding **claims 1 and 12**, Masuda discloses a system and method for detection of printing defects ("inspecting device for print for detecting a defect occurred on the printed sheet" at col. 1, line 6) comprising:

data reading means for reading multi level data of reference of each of colors from a printed paper ("inspecting device for a print which is capable of accurately detecting the printing defects of yellow, magenta, cyan and black inks in a color print" at

col. 2, line 38; figure 2, numeral 8, which is equivalent to applicant's disclosed device for acquiring images) on which images are printed to be good ("printing at present is normal and has sufficient printing quality as the reference of the inspection" at col. 8, line 38), so that multi level images of reference can be reproduced in a memory from the multi level data of reference ("the reference information is stored in the memory 15" at col. 8, line 54),

data reading means for reading multi level data of inspection of each of colors from a printed paper which is fed when inspecting ("In the inspection mode, the image information of the print pattern of the printed sheet which is sequentially printed is delivered" at col. 8, line 56) so that multi level images of inspection can be reproduced in a memory from the multi level data of inspection; and

data processing and comparing means (figure 1, numeral 6, which is equivalent to applicant's disclosed processor and comparator) for comparing the multi level images of inspection with the multi level images of reference for inspection (figures 10A and 10B) of stained parts and blurred parts ("printing defect such as dripped water or oil" at col. 9, line 36; "stains occur as a printing defect" at col. 9, line 40).

Masuda does not teach converting the multi data of reference and inspection into two level data of reference and inspection.

Ohnishi discloses a system and method in the same field of endeavor of print defect detection ("method and apparatus for detecting a defect on a surface of a to-be-checked sheet" at col. 1, line 16) where multi level data of reference and inspection are converted into two level data of reference and inspection (figure 1, numerals 7 and 13).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the processing circuit of Masuda using the data conversion taught by Ohnishi as described above, to overcome unreliability "when a large number of types of sheet materials are to be subjected to defect detection" (Ohnishi at col. 2, line 1).

Regarding **claims 2 and 13**, Masuda discloses a system and method comprising partitioning images of reference and images of inspection into parts to compare the images of inspection with the images of reference at every part ("entire print pattern by a line sensor such as a CCD... along scanning lines" at col. 3, line 52; figure 18, scanning lines).

Regarding **claims 3 and 14**, Masuda discloses a system and method further comprising:

predetermining means (figure 1, numeral 6, which is equivalent to applicant's disclosed structure) for predetermining areas for decision of stained parts or blurred parts (figures 11 A and 11B, threshold lines); and

deciding means (figure 1, numeral 6, which is equivalent to applicant's disclosed structure) for deciding on stained parts or blurred parts when the images of inspection include portions disagreeing with the images of reference and the portions have areas exceeding the areas for decision of stained parts or blurred parts (figure 8, error signals ER1 and ER2).

Regarding **claims 4 and 15**, Masuda discloses a system and method further comprising alarm means ("alarm means such as a display unit, a marking unit or a

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rejecting unit” at col. 9, line 2, which is equivalent to applicant’s disclosed alarm) for generating an alarm of stained parts of blurred parts when finding stained parts or blurred parts (figure 7, numeral 13; “When the judging circuit judges the presence of the defect, an error signal is transferred to the CPU board 17, which thus operates alarm means” at col. 8, line 68).

Regarding **claim 5**, Masuda discloses a method further comprising the step of detecting positional variations of the printed paper at every page when the printed paper is fed (figure 19), to compensate for the positional variations in the images reproduced in the memory (“displacement of synchronization of the print patterns of a plurality of sheets of the next set is corrected” at col. 14, line 4).

Regarding **claim 9**, Masuda discloses a system and method comprising:

determining a limit of lowest stained density (figure 12A, “threshold signal”) near a level of lowest printed density for inspection of stained parts (“threshold signal” corresponds to a print density that is in close proximity to the reference densities), the limit of lowest stained density being disposed above the level of lowest printed density (the threshold is above the level of lowest printed density in figure 10A),

determining a limit of highest blurred density (figure 12B, upper “threshold level”) near a level of highest printed density for inspection of blurred parts (“threshold level” corresponds to a print density that is in close proximity to the reference densities), the limit of highest blurred density being disposed below the level of lowest printed density (the threshold is below the level of highest printed density in figure 10B),

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predetermining means for predetermining a limit of minus differential density (figure 11A, x-axis at voltage = 0, since pixel densities below the reference densities are candidates for blurs) independently of the limit of lowest stained density for inspection of shortage of printed density ("threshold value is set to the twice differential signal produced by taking the difference between the differential signal...and a signal displaced (delayed) by several pixels" at col. 10, line 9), having the limit of minus differential density being disposed above the limit of lowest stained density (the lower "threshold level" corresponds to the maximum tolerance level of negative difference between the inspection print density and the reference print density, so the lowest stained density level is at a distance equivalent to the "threshold level" below the reference density),

predetermining means for predetermining a limit of plus differential density (figure 11B, x-axis at voltage = 0) independently of the limit of highest blurred density for inspection of excess of printed density for inspection of blurred parts, having the limit of plus differential density being disposed below the limit of highest blurred density (the upper "threshold level" corresponds to the maximum tolerance level of negative difference between the inspection print density and the reference print density, so the highest blurred density level is at a distance equivalent to the "threshold level" above the reference density),

reading multi level data of reference of each color from a printed paper on which good images are printed;

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reading multi level data of inspection of each color from a printed paper which is fed when inspecting;

using the multi level data of reference, and the multi level data of inspection, the limit of lowest stained density and the limit of highest blurred density for inspection of stained parts or blurred parts; and

using the multi level data of reference, and the multi level data of inspection, the limit of minus differential density and the limit of plus differential density for inspection of shortage or excess of printed density.

Masuda does not teach predetermining the limit of lowest stained density and the limit of highest stained density.

Ohnishi discloses a method where the threshold level of the inspected images is predetermined by an operator ("threshold levels are respectively set in binarization circuits 7 and 13 by the keying-in operation" at col. 4, line 62).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the error judging method of Masuda to predetermine the thresholds of lowest stained density and highest blurred density using the thresholding taught by Ohnishi as described above, to allow for more flexibility of the threshold values.

10. Claims 6, 7, 10, 11, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Masuda and Ohnishi as applied to claim 9 above, and further in view of Ohnishi.

The Masuda and Ohnishi combination teaches the elements of claims 1 and 9 as described in the 103 rejections above.

Regarding **claims 6, 10 and 16**, Masuda does not teach converting the multi data of reference and multi data of inspection into two level data when exceeding the threshold of lowest stained density of highest blurred density by using the thresholds of lowest stained density and highest blurred density.

Ohnishi discloses a system and method where multi level data of reference and inspection are converted into two level data of reference and inspection.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the processing circuit of Masuda and Ohnishi using the data conversion taught by Ohnishi as described above, to alert the operator only when a "significant difference as a defect" (Ohnishi at col. 4, line 50) is detected.

Regarding **claims 7, 11 and 17**, Masuda teaches a method further comprising:
predetermining areas for decision of shortage or excess of printed density (any pixels with densities that do not correspond to the reference pixels' densities),
comparing the multi level data of inspection with the multi data of reference at every pixel for inspection of shortage or excess of printed density (figures 11A, 11B, differential signals; a positive or negative voltage corresponds to a potential excess or potential shortage of density), and

deciding on shortage or excess or printed density when the difference exceeds the limit of minus differential density or plus differential density by portions having areas

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which exceed the areas for decision of shortage or excess of printed density (figures 11A, 11B).

11. Claim 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Masuda, Ohnishi, and Ohnishi as applied to claims 7 and 17 above, and further in view of Juang (US 5,999,636).

The Masuda, Ohnishi and Ohnishi combination teaches the elements of claims 7 and 17 as described in the 103 rejection above.

The combination does not teach generating an alarm of shortage or excess of printed density when finding out that shortage or excess of printed density.

Juang discloses a system and method comprising generating an alarm (figure 1, numeral 7) of shortage or excess of printed density when finding out that shortage or excess of printed density (figure 3; "flaw grade values are compared to the proper threshold values, which are user specified, to obtain the final accept or reject decision" at col. 3, line 58).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the error judging circuit of Masuda, Ohnishi and Ohnishi using the flaw grading taught by Juang as described above, to allow for some flexibility in detection of density defects.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,144,566, US 7,017,492, US 5,712,921, US 5,255,329, US 5,255,331, US 6,366,358, and US 6,535,621 are all pertinent as teaching image based print inspection systems and methods.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katrina Fujita whose telephone number is (571) 270-1574. The examiner can normally be reached on M-Th 8-5:30pm, F 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Katrina Fujita
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BRIAN WERNER
SUPERVISORY PATENT EXAMINER